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UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

NEWS LETTER

FOR JUNE 1941

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ADMINISTRATION

The following statement in reference to the Bureau, its activities, and functions, prepared on July 21, 1941, is believed to be of general interest.

The Bureau of Entomology and Plant Quarantine was created by organizational mergers brought about by administrative orders of the Secretary of Agriculture issued in 1933 and 1934 and given general legislative approval in the "Agricultural Appropriation Act of 1935," approved March 26, 1934, and the "Agricultural Appropriation Act, 1936," approved May 17, 1935. These mergers brought together activities of the Department concerned with investigations on insect pests, conducted by the Bureau of Entomology; activities concerned with the enforcement of plant quarantine regulations and operations to control and prevent the spread of insect pests which had gained limited foothold in the United States, conducted by the Bureau of Plant Quarantine; operations aimed to control or eradicate plant diseases, conducted by the Bureau of Plant Industry; and chemical investigations on insecticides and fungicides, carried on by the Bureau of Chemistry and Soils.

The functions of the Bureau cover a wide field of interrelated activities concerned with (1) ways of protecting man, his crops, livestock, and possessions from insect pests; (2) preventing the introduction and spread of plant pests through the importation and interstate movement of plants and plant products; and (3) action programs to eradicate, suppress, or control insect pests and plant diseases. Its functions include research, service, regulatory, and control activities and involve contacts and cooperation with most of the Bureaus of the Department and many units of other Departments; with agricultural agencies throughout the United States and in other countries; and with industry, transportation concerns, farmers, and others concerned with agriculture in its broadest sense.

Research activities.--There are more than 700,000 known kinds of insects of which more than 250,000 are known to occur within the United States. Many of these are injurious, a goodly number are beneficial, and others are of little or no economic importance as far as known. The investigations on insects and their economic relations involve studies of their characters, classification, anatomy, physiology, responses, habits, life history, and distribution with the view of developing practical and economical methods for destroying harmful ones and promoting and increasing the usefulness and distribution of those which are beneficial. Such studies are concerned with species injurious to agriculture and forestry, those which attack and annoy man and animals affecting their health, those which infest human habitations, and those which are injurious to industries or destroy possessions and products. They also deal with the culture and use of honeybees and with beekeeping practices to develop fuller utilization and returns from this important beneficial insect. The development of control measures includes consideration of the use of natural enemies, cultural practices, mechanical means and devices, and the use of chemicals to attract, repel, and kill noxious species. Chemical investigations are conducted on problems relating to the composition, action, and application of insecticides and materials that may be used with them and to develop methods by which such materials may be manufactured.

Service activities.--Insects affect man, agriculture, and forestry in many ways. One of the important functions of the Bureau is the service it gives by disseminating information on how pests can be controlled and useful species utilized. This is done through correspondence, publications, and by other devices, including supplying information to extension agencies. Research is the basis of such service. The service activities are not restricted to giving advice but under appropriate conditions include surveys to determine the status of pests and technical planning and supervision of control operations carried on by other Federal agencies, States, local communities, and individuals. Service also includes aid in matters relating to plant quarantines and inspections and certifications of regulated products so they may move freely and in full compliance with plant quarantine regulations.

Regulatory activities.--An important part of the work of the Bureau is concerned with the enforcement of plant quarantines and regulatory orders designed to prevent the introduction and spread of plant pests, the introduction of a disease of the adult honeybees, and the inspection and certification of plants and plant products to meet the sanitary requirements of foreign countries. There are 40 Federal plant quarantines and regulatory orders now in effect--22 of which relate to the entry of products from foreign countries, 10 relate to the movement of products within the mainland of the United States, and 8 relate to movement of products from Hawaii and Puerto Rico to the mainland.

These activities are carried out in close cooperation with State and territorial officials. The Bureau advises the Secretary on matters relating to plant quarantines and is responsible to him for the enforcement of the following acts dealing with plant quarantines and related matters:

(1) The Insect Pest Act of 1905.

(2) The Plant Quarantine Act of 1912, as amended.

(3) The act of 1922 governing the importation of adult honeybees.

(4) The Terminal Inspection Act of 1915, as amended, which is enforced in cooperation with the Post Office Department.

(5) The so-called Mexican Border Act which is reenacted annually and regulates the movement of railway cars and other vehicles into United States from Mexico.

(6) The so-called Export Certification Act which is reenacted annually and authorizes the inspection and certification of plants and plant products to meet the sanitary requirements of foreign countries.

Operations to control insect pests and plant diseases.--In cooperation with State and local agencies the Bureau carries on operations to eradicate, suppress, or control insect pests and plant diseases which occur as incipient or emergency outbreaks or have been introduced and gained limited establishment within the United States. These activities are carried on under authority included in the act making appropriations to the Department or under the special legislation approved April 6, 1937, and amended May 9, 1938, which authorized the Department to cooperate with State, local agencies, and individuals to control incipient and emergency outbreaks of insect pests and plant diseases.

Organization.--To carry out the activities and functions assigned to the Bureau it is now organized into 23 divisions. Twelve of these deal with research, 6 with control and prevention of spread, 4 are concerned with service to the Bureau, and 1 has regulatory functions only. Five of the divisions are headquartered in the field. The others have headquarters in Washington.

Regular projects.--The activities of the Bureau carried out under regular appropriations are provided for under 25 subappropriation items and classified in the project system of the Department under financial work and research line projects. Classified under the main functions referred to above these projects are divided as follows:

Function	Financial Projects	Work Projects	Line Projects
Research	27	81	839
Service	4	10	-
Regulatory	4	12	-
Control	9	36	-
Total	44	139	839

Laboratories and offices.--The Bureau carries on the work assigned to it within every State in the United States, in Hawaii, in Puerto Rico, and in the Canal Zone and has field laboratories in Mexico, Japan, and Uruguay. One hundred and twenty-six laboratories are maintained at various places in the United States for carrying on investigations, and 295 offices and suboffices to aid in conducting regulatory and control operations. Where practicable headquarters for these various functions are housed in the same buildings and in many cases the quarters are supplied by cooperating State or local agencies.

Personnel.--With the regular funds appropriated for the use of the Bureau it employs under departmental appointment on the average of 3,200 people. In addition to this a goodly number of individuals are employed by field agents under letter of authorization--the numbers varying with the season and needs for the work. These figures do not include those employed on projects conducted under allotments from funds provided for emergency relief which in June 1941 totaled 6,825.

For June 1941 the appointed employees paid from regular funds totaled 3,358--316 of these are headquartered in Washington and 3,042 at various locations in the field.

Funds appropriated or allotted to the Bureau for 1942.--The funds provided for carrying on the work of the Bureau for the current fiscal year come from a number of sources as indicated in the following tabulation:

Salaries and expenses from regular appropriation act	$ 5,329,978
Allotment for research from funds provided through appropriations authorized by the Bankhead-Jones Act	15,700
Allotment for research from Commodity Credit Corporation Capital Fund	16,000
Allotment for service from appropriation to Civilian Conservation Corps	5,000
Appropriation for the control of incipient and emergency outbreaks of insect pests and plant diseases--season 1941	2,225,000
Allotment from WPA appropriation for relief for 6 months, ending December 31, 1941	2,432,075
Total	$10,023,753

The regular appropriation "Salaries and Expenses" may be divided into groups as follows:

Administration	$ 165,980
Research	2,187,532
Control and prevention of spread, including enforcement of certain domestic plant quarantines	2,210,545
Regulatory only	765,921
Total	$ 5,329,928

Activities carried on to combat incipient and emergency outbreaks of plant pests.--Operations conducted in cooperation with State and local agencies to eradicate, suppress, or control plant pests with funds provided under special authorizing legislation vary from season to season. The following tabulation lists the projects now underway, gives the amount of funds now allotted to each, and the name of the division of the Bureau responsible for the administration of the work:

Project	Allotment	Division
Grasshopper and Mormon Cricket Control	$ 553,000	Domestic Plant Quarantine
Chinch Bug Control	300,000	" " "
White-Fringed Beetle Control	300,000	" " "
Pear Psyllid Control	365,000	Fruit Insects
Hall Scale Eradication	30,000	" "
Screwworm Control	6,500	Insects Affecting Man and Animals
Sugarcane Mite Eradication	800	Cereal and Forage Insects
Administrative Expenses	45,000	Administration
Unallotted	624,700	--
Total appropriation	$2,225,000	

Projects carried on with allotments from WPA.--The $2,432,075 provided from emergency relief appropriation for the first 6 months of the current fiscal year is allotted for carrying on 8 projects. The following lists these, gives the amount allotted to each activity and indicates the division of the Bureau responsible for the administration of the work:

Project	Allotment	Division
Blister Rust Control	$ 637,000	Plant Disease Control
Barberry Eradication	391,500	" " "
Phony Peach Disease Control	84,500	Domestic Plant Quarantine
Peach Mosaic Control	62,500	" " "
Citrus Canker Eradication	24,500	" " "
Gypsy Moth Control	341,000	Gypsy Moth Control
Dutch Elm Disease Eradication	864,000	Japanese Beetle Control
Wild Cotton Eradication	23,000	Pink Bollworm Control
D. C. Administration	4,075	Administration
Total	$2,432,075	

F. S. PUCKETT
Senior Administrative Officer
Division of Pink Bollworm and Thurberia Weevil Control

Word has just been received that Felix S. Puckett died suddenly at San Antonio, Tex., on July 23, 1941. He was born on March 7, 1885, in Buda, Tex. He attended the Texas A. & M. College, graduating in 1907 with the Bachelor of Science degree. He pursued graduate work at that institution the following year and became associate director of the North Carolina Experiment Station in 1910, serving for 5 years. He then became associated with an industrial concern dealing with potash, and served as the publicity agent for this firm until he became associated with the U. S. Department of Agriculture.

Since October 8, 1917, Mr. Puckett has been in continuous employment with the Department and, with the exception of a short period beginning in 1928, has been connected with work on pink bollworm eradication and control. He was in general charge of field operations carried on in cooperation with the State of Texas to eradicate the early discovered infestations of pink bollworm and was responsible for organizing and directing clean-up work. His long association with the work of pink bollworm control made him unusually well qualified to be in charge of the business operations of this project. For many years he has been the business manager of the work associated with pink bollworm control and quarantine enforcement. In 1928 he was transferred to a similar position in connection with the work on European corn borer. This assignment was terminated in 1930, when he returned to the pink bollworm project.

Mr. Puckett was a conscientious and indefatigable worker and a valuable employee.

BUREAU EMPLOYEES CALLED TO THE COLORS OR TRANSFERRED TO SPECIAL NATIONAL DEFENSE ASSIGNMENTS.

Buck, Fred H., Agt., Pl. Dis. Cont. (BRC), on furlough, inducted, Selec. Serv., June 25, 1941.

Crumb, Samuel E., Jr., Asst. Fld. Aide, Truck C. Ins., inducted, Selec. Serv., June 23, 1941.

Nalewaik, William J., Agt., Jap. Beetle Cont. (DED), O.R.C., Natl. G., called to active duty July 1, 1941.

Scharlach, Arthur B., Agt., PBW Cont., First Lt., O.R.C., U.S.A., Fort Huachuca, Ariz., called to active duty July 1, 1941.

Walsh, Harry S., Chief Operating Engin., For. Pl. Quar., U. S. Naval Resv., resigned July 14, 1941, to answer immediate call for active service.

FRUIT INSECT INVESTIGATIONS

Propylene dichloride for peach borer control.--Oliver I. Snapp, of the Fort Valley, Ga., laboratory, reports that preliminary experiments have indicated that propylene dichloride is more effective than ethylene dichloride against the peach borer. Ten-percent propylene dichloride emulsion gave a higher mortality of borers than the recommended 15-percent ethylene dichloride emulsion around 3-year-old peach trees, and 15-percent propylene dichloride emulsion gave a higher borer mortality than the recommended 20-percent ethylene dichloride emulsion around 12-year-old trees. No injury to the trees has yet been observed.

Colonization of imported parasite of Japanese beetle.--J. L. King and L. B. Parker, of the Japanese beetle laboratory, Moorestown, N. J., have reported on colonization of the hymenopterous parasite *Tiphia vernalis* Roh. during the spring of 1941. A total of 14,000 field-collected females were distributed in 139 colonies in New York, Pennsylvania, New Jersey, Connecticut, Rhode Island, Virginia, West Virginia, and Ohio. The colonies consisted of 100 females each, except 1 which had 200. To date a total of 1,561 colonies have been distributed in 12 States and the District of Columbia by the Bureau, in cooperation with State agencies. In addition, 1,500 females were supplied to the University of Maryland this spring for rearing purposes.

Use of carbon dioxide for anesthetizing Japanese beetle larvae.--In connection with the production of milky-disease spore material at the Japanese beetle laboratory at Moorestown, many thousands of Japanese beetle larvae are inoculated by injection of the inoculum into the body cavity. In this work extreme care is necessary to avoid puncturing the intestine, and the activity of the grub is an important factor in the procedure. S. R. Dutky has devised a method for anesthetizing the grubs, which consists of the use of dry ice to furnish carbon dioxide gas, which is used as an anesthetic to inactivate the larvae prior to injection of the inoculum. This prior inactivation has reduced the danger of losses of the inoculum during the injection process and has greatly facilitated the handling of the larvae. He has found that larvae may be anesthetized for a period of 8 hours with little or no ill effect.

Colonization of type-A milky-disease organism.--R. T. White, of the Japanese beetle laboratory, has reported the completion of the program of colonization of the milky disease, caused by Bacillus popilliae Dutsky, in New Jersey. This work was started in the fall of 1939 and has been carried out in cooperation with the New Jersey Department of Agriculture. A total of 450 plots, averaging about 3/4 acre each, were treated, the plots being located at about 3-1/2-mile intervals throughout the infested portions of the State. Milky-disease colonization is also being carried on in Maryland, Delaware, Pennsylvania, New York, and Connecticut, in cooperation with the appropriate agencies of those States. Colonization treatments have also been made during the fall of 1940 and the current spring at Government reservations throughout the generally infested beetle area. About 5,500 acres in all have been treated--approximately 1,500 acres in and adjacent to the District of Columbia, and the balance on 43 Government reservations in Maryland, Delaware, Pennsylvania, New Jersey, and New York.

MEXICAN FRUIT FLY CONTROL

Inspection completed in June.--The annual tree-to-tree inspection on citrus fruits in the regulated area under Quarantine 64 was completed before June 30. This inspection was the most difficult on record because the excessive rains had caused weeds to grow in great abundance and prevented cultivation of a large percentage of the groves. High water, weeds, and mosquitoes harassed the workers throughout the period of the inspection. Larval infestations for the season totaled 552. They were found during the following months: November, 1; February, 17; March, 168; April, 343; and May, 23. Trap recoveries for the year amounted to only 979 adult A. ludens. Total fruit shipments for the season declined 2,257 equivalent carlots from last season's production. The total production for this year was 44,198.3 equivalent cars. Of this amount of fruit 16,595.5 cars of grapefruit and 45.4 cars of oranges were processed.

CEREAL AND FORAGE INSECT INVESTIGATIONS

Hessian fly-resistant wheats commercially available in California.--L. G. Jones, Sacramento, Calif., reports that a breeding program for the production of wheat varieties possessing resistance to the hessian fly and to fungous diseases was begun in 1931 by W. B. Cartwright, of this Bureau, and G. A. Wiebe, of the Bureau of Plant Industry. This program was conducted by them for several years and has since been continued by W. B. Noble of this Bureau and C. A. Suneson of the Bureau of Plant Industry. By 1938, the first fly-resistant wheat suited to California conditions, Big Club 38, was ready for release. This was developed from a cross between the fly-resistant winter variety Dawson which is not commercially suitable to California and the fly susceptible spring wheat, Big Club, a good commercial variety there. In 1938 a 3-acre plot of Big Club 38 was sown for 1939 harvest, and a 30-acre field of it was sown the following year. In 1941 a 75-acre field of the new variety showed a plant infestation of 2 percent, as compared with an average plant infestation of 79 percent, with visible fly damage, in neighboring fields of the regular Big Club. Another wheat, known as Poso 41, is now ready for increase. The development of this variety involved the transfer of fly resistance from the winter wheat, Dawson, to the commercially desirable spring wheat, Poso. Although Big Club 38 and Poso 41 both possess a high degree of resistance to the strain of hessian fly prevalent in California they are not resistant to the common fungous diseases. Progress is being made, however, in the development of varieties resistant to these diseases, as well as the hessian fly. Resistance to the fly and also to the fungous disease, commonly called bunt, has already been established in one promising variety developed from a cross between Dawson and Big Club. By the use of a stem-rust-resistant line in the breeding operations, it is hoped that a strain of the popular Big Club type possessing resistance to hessian fly, bunt, and stem rust will be ready for release in 1943.

Control of armyworm in wheat.--R. G. Dahms, Lawton, Okla., reports that the amount of poison-bran bait necessary per acre and the possibility of a bait containing less sodium arsenite than usually recommended for the control of the armyworm (Cirphis unipuncta (Haw.)) in wheat has recently been investigated by R. G. Dahms, in cooperation with F. A. Fenton, of the Oklahoma Experiment Station. In all cases sodium arsenite was the poison used and bran was the carrier. No molasses or other attractant was used. Under the conditions of these experiments, 10 pounds, dry weight, of bran per acre was not enough for effective control of the armyworm. Bait spread at the rate of 20, 30, and 40 pounds per acre gave approximately the same kill. More worms were killed in a shorter time when 2 quarts of sodium arsenite were used per 100 pounds of bran than when 1½ quarts were used; however, at the end of 72 hours there was only 7.5-percent difference in favor of the 2-quart strength.

JAPANESE BEETLE CONTROL

Refrigerator-car fumigation.--Preparations were completed early in June for the fumigation of refrigerator cars with hydrocyanic acid and methyl bromide. The first car was fumigated at the Edge Moor, Del., yards on June 19. Owing to the great increase in the amount of freight being handled, all operations at this yard are confined to one track, whereas two tracks were available last year. Trains are constantly being drilled on either side of the track used for fumigation. This condition has greatly increased the danger to the men engaged in fumigation work. The number of cars fumigated was extremely light until June 26, when 14 were fumigated. From all indications, the peak at Edge Moor will not be reached until July. It is reported that, owing to dry weather, the crops in this area have been reduced approximately 50 percent. Fumigation of potatoes began at the Greenwich Yards, Philadelphia, on June 17. Up to June 26 more cars were fumigated there than at Edge Moor. One-pound cans of the fumigant were used at all points except Edge Moor and proved satisfactory. On cool days a little more time is consumed in emptying the cans, because of their lower pressure, but this is the only inconvenience encountered. Fumigation of empty refrigerator cars with HCN began in Baltimore on June 25. The same procedure was followed as last year, using liquid HCN and splashing 3 ounces in each end of the car.

Cut-flower and farm-products inspection.--Although the first emergence of adult Japanese beetles appeared to be earlier than usual, indications are that the peak flight of the insect will be no earlier than in other years. Accordingly, it was possible at the beginning of the summer quarantine on June 15, in most of the northern sections of the regulated area, to certify without actual inspection locally grown farm products and cut flowers. In the Elmira, N. Y., area, where cut-flower inspection has been a problem, arrangements were made to have all flowers grown by infested or unclassified establishments brought to a central location during certain hours for inspection and certification. Two carnation growers on Long Island started during the month to ship thousands of cut flowers each day to southern points. Shipments to these points will continue as long as prices hold, probably a few days into July. Inquiries at various estates in Westchester County, N. Y., indicated that 5 estates will make regular semiweekly shipments of cut flowers during July and August. On June 1 and 2, 5 temporary inspectors began work on the Eastern Shore of Virginia. Owing to the dry weather and the late potato season, cut flowers were the principal items inspected the first week in the month. Several large cut-flower establishments are now located in the vicinity of Cape Charles, Va. Because of the heavy infestation there, all cut-flower establishments making shipments to points outside the regulated area have screened packing sheds. Seventy-one adult beetles were removed from 1,117 boxes of cut flowers inspected in this area. On June 16, 21 temporary farm-products inspectors were employed on the Eastern Shores of Maryland and Virginia, and 18 in Delaware. Cabbage and lettuce were the first varieties of farm products offered for inspection in Virginia. String beans was the first crop to be certified from Maryland. During the month cabbage, cucumbers, garlic, onions, string beans, and white potatoes were offered for inspection. Sixty-nine beetles were removed from approximately 80,000 units of farm products inspected.

Reduced dosage of lead arsenate assists nurserymen.--Reduction from 1,500 pounds to 1,100 pounds per acre for lead arsenate treatment of nursery plots made it possible for one large New Jersey nursery to retain several sizable plots in a certified status that would otherwise have been discontinued. Results of analyses of soil samples collected at southern New York establishments showed that no releading was necessary in that area. Original leading totaling about 3 acres was done at several establishments on Long Island, and for the first time in recent years lead arsenate treating of nursery plots was performed at an establishment in Westchester County, N. Y. At the Westchester nursery a block of 2,000 small Taxus was treated with this material, in order to eliminate the labor and expense of carbon disulphide emulsion treatment which for several years has been the basis of certification at the nursery. At a Long Island establishment a valuable topiary yew was leaded for shipment in the fall. A Long Island greenhouse was treated with naphthalene flakes and screened for certification. In this area there were also 6 yards of potting soil fumigated with carbon disulphide for a perennial frame. Two experimental lead arsenate treatments of growing stock were made at a Maryland nursery late in June. If the shipper is satisfied with the results, additional treatments will be made next year.

Vegetable inspection in New Jersey.--Inspection of vegetable plants was the outstanding feature of plant-inspection work in New Jersey. This required the services of three inspectors during the entire month. Several thousand more plants were certified this month than in June 1940. The largest vegetable-plant grower was from 2 to 3 weeks behind schedule in filling orders, owing to the dry weather this spring. This same establishment grows large quantities of celery plants, which are generally shipped in July, but the dry weather ruined the entire crop. The business of this firm has been boosted by orders received from a mail-order firm doing a Nation-wide business.

Certified cabbage for surplus commodities.--Arrangements were made with a representative of the Federal Surplus Commodities Corporation at Cape Charles, Va., to obtain cabbage from a certified source for shipment outside the Japanese beetle regulated area and thereby avoid the necessity for fumigation of the car after loading. Seven carloads of this produce from an uncertified source were fumigated, however. One-pound cans of methyl bromide were used at this point for the first time and worked very satisfactorily. The blowers used to circulate the gas were of the old type, with four-strap hangers for supporting them in the bunker door, making them difficult to handle and install satisfactorily. As most of the work at Cape Charles is carried on at night, this arrangement is hazardous. Officials of the Pennsylvania Railroad were advised to return the blowers to the Edge Moor, Del., railroad yards, from which they were obtained, and request replacement blowers with one-strap hangers. This change was accomplished.

Fumigation of farm products in motortrucks.--Information was requested during June by the manager of the Eastern Shore Shippers Traffic Association, Onley, Va., on the possibility of fumigating farm products in refrigerator trucks and van-type motortrucks. Observations were immediately made concerning the feasibility of this type of fumigation. After examining many trucks, it was generally agreed by members of the staff of this Division and by Heber C. Donohoe, of the Division of Control Investigations, that refrigerator trucks are tight enough to fumigate, and that with their air-circulation equipment, bunkers, and vents, they are ideal for fumigation. The van-type of truck, however, presents a different problem. Work on fumigation of the latter type was continued into July.

Railroad men instructed in fumigation procedure at Pittsburgh.--On June 19 a representative of the treating section of the Division visited Pitcairn Yards of the Pennsylvania Railroad, near Pittsburgh, to check over the fumigation equipment on hand there. An empty refrigerator car was spotted on a spur track and railroad men instructed in the fumigation procedure. The hanger arm used in supporting the blower was too long and suggestions were made for shortening it. The devices for applying methyl bromide from the 1-pound cans were found to be of an old type. New applicators were ordered by the railroad. Two gas masks to be used by the fumigators had canisters for protection against HCN. These were removed and replaced with methyl bromide canisters.

Weather vs. beetles.--In reporting to the meteorologist of the Weather Bureau at Baltimore, one of the Weather Bureau's observers at Belair, Md., on June 30 wrote: "While reporting weather conditions, we are forcibly reminded of the havoc being wielded by the Japanese beetle. The beetle is doing more damage to crops, fruits, and truck gardens than any weather conditions, including wind and hailstorms. Unless there be some remedy to offset the Japanese beetle, it will take everything of a food nature, and that looks like an omen of famine." The letter was referred by the Weather Bureau to the district Japanese beetle office in Baltimore.

Rhode Island leases beetle traps to residents.--The Rhode Island State Department of Agriculture has this year adopted the policy of leasing Japanese beetle traps to individuals and others in the State at fees of 50 cents to $1.50 each, depending on whether or not the traps are tended by State men or by the individual renting the trap. Brayton Eddy, administrator, Division of Entomology and Plant Industry, anticipates a shortage of State traps for rental purposes.

Soil analyses completed.--Analyses of representative soil samples from lead arsenate treated nursery plots, heeling-in areas, and coldframes were completed at the Moorestown, N. J., laboratory during the month and the results were given to the nurseries concerned so that the necessary retreatments to bring the lead arsenate content up to the required dosage could be made before the July deadline.

Nursery and greenhouse scouting under way.--Assignment of scouts to survey class I nurseries and greenhouses for the presence of the Japanese beetle began in Maryland and Virginia on June 18. Beetles were found on a few plots that were uninfested last year. Heavy flight of the adult was expected early in July in this area. Extension of the scouting to more northern districts will proceed as soon as adult emergence warrants.

Copper scarcity forces grower to screen with netting.--In rescreening seven certified greenhouses at Red Bank, N. J., a large classified grower was able to obtain copper wire sufficient for only three houses. The hardware-supply house informed the superintendent of the greenhouses that it would take from 6 to 8 months to obtain delivery of additional wire. The remainder of the houses were screened with netting, which will require annual replacement.

Virginia beetle found during New York inspection.--On June 25 an inspector in New York City examining cut flowers for shipment to a point outside the regulated area found an adult Japanese beetle on cut gladiolus just received from Cheriton, Va.

Federal Housing project includes leaded plots.--One of the large nurseries in northern New Jersey has sold 42 acres of the establishment for a Federal Housing project. Twenty-one lead arsenate treated plots were included in this acreage.

Gypsy and brown-tail moth inspections.--Owing to the seasonal life cycle of the gypsy moth, only 1 egg cluster was found in the course of June inspection. This was observed on nursery stock offered for inspection. The item was refused certification and uninfested stock was substituted. Larval infestation was found in 2 truckloads and 1 carload of lumber, 2 carloads of excelsior, and 1 truckload of laurel. A total of 84 gypsy moth larvae were removed and destroyed. In addition, 42 larvae of brown-tail moth were found during the inspection of a carload of reels.

Training schools for W. P. A. Dutch elm disease scouts.--W. P. A. scout training started in the States of Connecticut, New Jersey, New York, and Pennsylvania during the first week in June. In Connecticut, since a constant general training had been carried on throughout the sanitation period, it was possible to put crews of experienced men in the field almost immediately. The training of all former and potential scouts was completed in New Jersey by June 7, using portions of 2 rainy days for instruction at field headquarters. In some districts in Pennsylvania, training was carried on in conjunction with scouting. The Pennsylvania schools were established at Philadelphia, Reading, and East Stroudsburg. In the Binghamton, N. Y., area there was no typical wilting of elm foliage that could be observed by the new men, so the time was devoted to training the men in climbing, use of maps, and writing of suspect cards. Training was stressed in the Athens, Ohio, area, advantage being taken of 2 days of heavy rain to keep the regular men in the garage and give them a review of the important features connected with scouting work. A thorough mental and physical adaptability test was used for the new men. In the Wilkes-Barre, Pa., area, 1 day was spent in training men in the principles of scouting for Dutch elm disease symptoms and in the proper use of ropes for climbing. Over 50 percent of the men in this area were experienced scouts, and with the new men distributed among the experienced crews, it is not believed that the quality of scouting will suffer for lack of a more extended training period.

Scout schools for men on regular funds.--Training of new scouts employed on Departmental funds was started on June 9, with 50 men. By June 15, 37 of these were sent to the various detached areas for summer scouting work. The following week, the scout school was continued for a large group of regular fund men. The training program was conducted on the property of the Elizabeth Water Company, in Union Township, Union County, N. J., at the same location used in previous years. In all a total of 243 men were enrolled for training and of these 205 completed the training and were assigned to Connecticut, New York, and Pennsylvania. Elm identification, Dutch elm disease symptoms, and climbing were allotted the major portion of the training schedule. Most of the men were assigned to the field on the completion of their third day of scout school.

W. P. A. field operations interrupted pending allotment of funds.--On June 27, owing to uncertainty as to availability of funds after July 1, the Security Wage workers were told not to return to work until notified. They turned in their tools and equipment and these were checked over. Field operations were considerably curtailed by the necessity for moving some of the county headquarters, closing garages, dismantling, packing, and loading equipment and transferring it to storage at the Newburgh, N. Y., warehouse. As this was the end of the fiscal year and the outlook for next year's program uncertain, little or no new work was started during the last week in the month, but a special effort was made to finish work already started, such as the final cleaning up of wood piles, beetle traps, and scattered beetle-infested elms.

Powder-company police arrest scout crew.--While scouting in Belvidere Borough, Warren County, N. J., on a street opposite the New Jersey Powder Company, a Dutch elm disease scout crew was arrested by the powder company's police. The scouts were taken to the guard's office in custody, and after 1½ hours' questioning, and long after they had shown their identification cards, they were released. The men were arrested in the town and apparently not on the powder company's grounds. Their maps were confiscated but were returned to them when they were released. The foreman of the crew had previously performed work inside the fence and had received several passes from the chief guard.

Oxen get truck out of ditch.--Timely assistance was rendered by a farmer to a Dutch elm disease scout crew in Connecticut. The crew's truck had become mired in a mud hole of a dirt road. A nearby farmer, observing their predicament, insisted upon offering aid. His yoke of oxen were soon hitched to the front bumper and with a few "gees" and "haws," coupled with observations on the undependability of modern transportation, the farmer soon had the scouts on their way.

Hot weather wilts elms.--As a result of hot weather late in the month, wilted elms appeared in greater numbers than had been the case in some previous summer periods. Elm leaf beetle defoliation was also becoming quite pronounced by the end of June.

Bethlehem field station and Easton garage moved to Allentown.--The Dutch elm disease headquarters in Pennsylvania, formerly located in Bethlehem, was moved to 532 Hamilton Street, Allentown, at the end of June. The Easton, Pa., garage was also vacated and moved to 123 South Jordan Street, Allentown.

FOREST INSECT INVESTIGATIONS

Parasitization of hibernating oriental hag moth cocoons.--P. B. Dowden, of the New Haven, Conn., laboratory, reports as follows: "Last winter a number of collections of hibernating cocoons of Cnidocampa flavescens Wlk. were made by the Massachusetts Department of Conservation in the vicinity of Boston, Mass., and sent to the New Haven forest insect laboratory for dissection. The purpose of the work was to evaluate the role being played by the imported tachinid fly Chaetexorista javana B. & B., which overwinters as a larva within this host. A total of 3,918 living cocoons were dissected. Fifty-eight percent of them contained Chaetexorista larvae, but unfortunately many of the parasite larvae were dead. Only 23 percent of the hag moth cocoons contained living Chaetexorista. These figures are of interest, when compared with similar work done the previous year. About the same number of cocoons were dissected. Forty-seven percent contained Chaetexorista larvae, and 38 percent contained living larvae of this parasite. Most of the collections were made from towns north of Boston, particularly Medford, Revere, Winthrop, Beverly, and Salem. South of Boston the host population was at such a low level that only a few small collections of cocoons could be made."

Parasite of sawfly cocoons possibly established prior to recent importations.--J. V. Schaffner, Jr., of New Haven, Conn., reports that Microplectron fuscipennis Zett. is very abundant in an infestation of the sawfly Gilpinia frutetorum (F.) in a plantation of red pine at Southington, Conn. This sawfly infestation was called to our attention early in May by members of the staff of the Connecticut Agricultural Experiment Station. The infestation is in a block of about 5 acres of red pine trees, 25 feet in height. The trees had been fed upon rather heavily in 1940, the defoliation ranging from about 25 to 60 percent. The sawfly hibernates as prepupal larvae in cocoons in the duff. Recent rearings have disclosed the species to be Gilpinia frutetorum (F.), which is of European origin, and that a very large proportion of the cocoons were parasitized by a small hymenopteron. The parasite was identified as Microplectron fuscipennis by P. B. Dowden, of this laboratory, and later verified by the Division of Insect Identification. Liberations of this parasite were made in European spruce sawfly infestations in Orange, Conn., in 1936 and in Westfield, Mass., in 1938, these points being respectively about 25 miles southwesterly and 35 miles northerly from the G. frutetorum infestation in Southington. It seems improbable that this small parasitic insect could have migrated 25 to 35 miles and increased to such a large population as is present in the Southington infestation in the 3 to 5 years since the liberations were made. It is believed, therefore, that the parasite may have been introduced into this area with its host.

Dinitrocyclohexyl phenol effective against gypsy moth.--S. F. Potts, of the New Haven, Conn., laboratory, reports that a concentration of 1 pound of dinitrocyclohexyl phenol per 100 gallons of water applied to small plots gave complete kill of fifth-instar gypsy moth larvae in 5 days. Five pounds of cryolite gave slightly better kill than 3 pounds of lead arsenate per 100 gallons of water.

Dry weather causes lowering of voltage gradient in trees.--T. J. Parr, of the New Haven, Conn., laboratory, reports that the voltage gradients in trees of all species tested have been affected by the spring drought in New England. Normally, bases of the trees should be positive to the top early in the spring, and as growth starts a reversal should take place and the tops become positive to the base. This reversal started in April, but with the onset of dry weather the gradients began to sink again, and only recently, following several rains, have the tops become positive. The gradient in all trees is lower by several millivolts than it was at this time in 1940, and it now seems probable that the effect of the drought will be evident in the voltage gradient readings throughout the year.

Period of activity of overwintering adults of Hylurgopinus rufipes (Eich.) during spring.--R. T. Webber, Morristown, N. J., observed that elm logs cut March 26, 1941, were attractive to active adults that were moving away from their hibernation quarters in the bark of standing living elms. The fresh-cut logs were racked in piles and covered with cheesecloth which was supported over them by a framework made of furring. This was incidental to another experiment, but afforded an opportunity to determine the period of time when most overwintering adults are active in search of breeding material. Adults were first attracted to the log piles late in April but appeared in large numbers from May 1 to May 25, then decreased rapidly in numbers until June 15, after which date no adults were attracted. The emergence of adults in the spring of 1941 from overwintering larvae did not occur until May 29. This first emergence occurred soon after the last date of extensive activity of overwintering adults--May 25. These observations indicate that there is a vast amount of attack of susceptible elm wood for breeding purposes during May. Such material thus serves as a reservoir of Ceratostomella ulmi. Further data is being collected during this season on the activity of adults originating from overwintering larvae.

Fumigation and spray tests with hibernating H. rufipes adults.--R. R. Whitten and W. C. Baker, of the Morristown, N. J., laboratory, report on their experimental results for the control of hibernating H. rufipes adults in elm trees of small size, using orthodichlorobenzene sprays and methyl bromide fumigation. None of the spray mixtures tested gave effective control. In the methyl bromide fumigation treatments, dosages ranging from 2 to 5 pounds per 1,000 cubic feet and exposures of from 2 to 4 hours were tested. Only dosages of 3½ and 5 pounds gave promising results and these need further experimentation before any definite conclusions can be drawn.

Experimental forest-insect control project.--J. C. Evenden, of the forest-insect laboratory at Coeur d'Alene, Idaho, reports that the experimental bark-beetle control project conducted through the cooperation of the Forest Service during May and June, to test the practicability of penetrating sprays as a means of controlling the mountain pine beetle in white pine, has been completed. During this period extremely bad weather prevailed, which tended to reduce the efficiency of the operation and to place the treatment under unfavorable conditions. However, if under such adverse circumstances the method is found to be effective, it can be adopted with safety. During this project over 1,000 trees were treated with a solution of orthodichlorobenzene and fuel oil. Experiments were conducted testing different strengths of orthodichlorobenzene, as well as the possibility of using water with an emulsifier to supplement the use of oil as a carrier. The final results of this project will not be available until the latter part of July, when the last examinations as to the effectiveness of the spray will be made.

GYPSY MOTH AND BROWN-TAIL MOTH CONTROL

Semi-inaccessible infestations sprayed from autogiro.--Plans for the aerial treatment of a number of gypsy moth infestations in towns located within the barrier zone by flying over them with an autogiro owned by this project, and equipped with an apparatus which mixes the lead arsenate and fish oil in the proper proportions immediately after the materials are projected into the air, were completed before the end of May. This apparatus and the method of treatment were developed by the Bureau of Entomology and Plant Quarantine. The infestations selected for this type of treatment varied in size, and were situated on high elevations that would require the use of extremely long hose lines and which would be decidedly difficult to reach with ground-spraying equipment. It was planned to base the autogiro at a small airport in the vicinity of each section to be treated. It was expected, because of the extremely early hatch this spring, that the work would be started during the latter part of May. However, the foliage development at the higher elevations was somewhat retarded, and sufficient growth for satisfactory treatment was not present until the first of June. On June 2 the autogiro was flown from its temporary base at the airport in Turners Falls, Mass., to the Canaan, Conn., airport. The first area selected for treatment consisted of about 150 acres in Canaan. The terrain was extremely uneven and it was found that the movements of air currents over the area at certain times, particularly in the evening, were so violent that there was a decided tendency for the lead arsenate and fish-oil solution to be blown entirely outside of the area where treatment was desired. Treatment flights were practical on only one evening while the autogiro was treating this area. Conditions were usually best for treatment flights from daylight until 8 or 9 a.m. and from a little before sundown until dark. All of the aerial treatment work planned for Connecticut was completed on June 16. The autogiro then moved to a private airport in Sheffield, Mass., for the treatment of the Mount Washington infestation. The treatment of this area was completed on June 21. After demonstrating aerial treatment work at a meeting of foresters in Durham, N. H., the selected infestations in Vermont were treated. All treatments were made at the rate of 30 pounds of lead arsenate per acre.

Autogiro demonstrates aerial gypsy moth treatment.--A meeting of the New England section of the Society of American Foresters, in conjunction with the American Association for the Advancement of Science, was held on the campus of the University of New Hampshire, at Durham, from June 23 to 26. The meeting was largely attended and included prominent foresters and entomologists, and delegates from associated activities. Shortly before noon on June 24 an opportunity was given to examine the autogiro and apparatus used in the aerial treatment of gypsy moth infestations, developed by the Bureau of Entomology and Plant Quarantine. An area of ground near the University campus was then treated from the air in view of the assembly. The aerial treatment of gypsy moth infestations in the barrier zone area was interrupted for 1 day in order to make this demonstration possible.

Increased gypsy moth work in Vermont.--Shortly before the first of June a sufficient number of additional men had been assigned to gypsy moth work in Vermont to organize 2 more crews. One of the new crews was assigned to scouting in Lowell Township, Orleans County, where 3 other crews were already employed, and the other crew began work in Swanton, Franklin County. A total of 12 W. P. A. crews were then working in 5 western Vermont counties. Four of the crews were employed in Orleans County, 1 in Franklin County, 5 in Rutland County, and 2 in Bennington County. In addition, a small crew of regular employees was engaged on a special assignment in Addison County. Within a few days scouting work was discontinued in all Vermont towns, except in 1 town in Orleans County, and the crews began the spraying of infestatiens. Some burlapping work at infestations where thinning work had previously been done was also accomplished. Spraying work was started on May 27 in Woodford Township, Bennington County, southern Vermont, at the base of a mountainous ridge where the foliage had developed sufficiently to warrant this type of work. Spraying continued toward the summit of the ridge as the foliage expanded. The spraying of other sections was begun a few days later and progressed satisfactorily, despite the fact that most of the crews were necessarily directed by inexperienced foremen. It was necessary to discontinue spraying operations for 3 days about the middle of June. These days were scheduled as nonworking days, although they were available for make-up time. Because of the long period of fair weather, the men had no time to make up and a halt in the work was necessary.

Gypsy moth spray hose damaged by hedgehogs.--Hedgehogs have damaged many lengths of gypsy moth spray hose this season in the Massachusetts-Vermont area, by gnawing off the outside rubber casing and biting into the underlying fabric. Hose damaged by these animals is usually located in those portions of the line near ledgy and densely wooded hillsides where their dens are most commonly located. Gypsy moth spray hose has frequently been so seriously damaged by hedgehogs during the night that it burst as soon as pressure was applied on the following day.

Gypsy moth spraying in Massachusetts.--Four gypsy moth sprayers began operating at infested locations in Massachusetts, where the development of the foliage had been most rapid, on May 26; and the remainder of the sprayers assigned to the Massachusetts barrier zone area were put into active service soon after June 1. Although working under several handicaps, the progress of the work was satisfactory during the month.

Connecticut gypsy moth spraying accomplished with small crews.--Foliage development in Connecticut advanced so rapidly this season that spraying operations could be started much earlier than usual. The first sprayer in that State was put into operation on May 16, in a location where conditions were especially favorable. Another machine began work in Litchfield County on May 26, and a third machine started on May 28. Weather conditions were favorable throughout the month.

Gypsy moth spraying in Pennsylvania.--By the end of May practically all residential spraying in the Pennsylvania area had been completed, and preparations had been made to move the sprayers and equipment to woodland spraying sites in Spring Brook, Madison, Roaring Brook, Covington, Lehigh, and Lackawanna Townships, in Lackawanna County; in Pittston, Kingston, Plains, Jenkins, and Bear Creek Townships, in Luzerne County; and in Coolbaugh Township, in Monroe County. By June 6, 25 sprayers were in operation on woodland spraying, while 2 sprayers were completing the spraying of several small and scattered residential infestations. These 2 machines, together with another recently transferred from the New England area, were available for woodland spraying by June 10. At mid-month 17 of the machines were working double shifts, 2 6-hour periods, whereas the remaining 11 machines were running on single 8-hour shifts. Seven of the latter sprayers were manned by N. Y. A. enrollees. The weather was generally favorable for spraying, although it was necessary to respray several small areas where heavy showers washed off the solution before it had had an opportunity to dry. Recent examinations of areas in Pennsylvania where spraying had been completed showed that effective killing had been accomplished. In view of the early date on which spraying was started and the generally fair weather that prevailed during the period, it is expected that satisfactory control of the insect will result this season in the treated areas.

Gypsy moth work done by C. C. C. during fiscal year 1941.--A total of 56,549 6-hour man-days were used by the C. C. C. on gypsy moth work during the fiscal year 1941, as compared with 70,630 man-days used during the previous fiscal year. The decrease in work was due chiefly to the low enrollments in the C. C. C., which caused the abandonment of many camps. Gypsy moth work was done on a total of 70,620 acres. Woodland scouting was performed on 52,873 of these acres, and open scouting on 11,690 acres. Silvicultural thinning work was performed on 2,070 acres, and burning work on 816 acres. Rebrushing was done on 1,517 acres that had been thinned during previous years. During these operations 264,274 gypsy moth egg clusters were destroyed. Only a small amount of burlapping work was possible this season, because of the necessity of using most of the available man power for spraying. During the fiscal year 1941, 161,866 trees were burlapped and 268,594 gypsy moth caterpillars and pupae were destroyed by the men patrolling the bands; however, most of this work was done during the previous larval season, which overlapped into the present fiscal year.

C. C. C. gypsy moth spraying.--C. C. C. gypsy moth work during June consisted mainly of spraying infested locations in Massachusetts and Connecticut with lead arsenate and fish-oil solution. The weather was unusually favorable for spraying operations. While some time was lost because of forest fires and rainstorms, the loss was offset to some extent by the replenishing of the water supply at several set-ups that would have had to be abandoned, had there been no rain. One sprayer operating in Massachusetts and two in Connecticut were loaned to the C. C. C. by the Bureau of Entomology and Plant Quarantine, while an additional machine was loaned by the Connecticut gypsy moth organization for work in that State. The latter organization also loaned several men to help in the work, as well as a considerable quantity of spray hose. Excellent cooperation was given by the camp superintendents during the spraying season by furnishing the men necessary to operate the sprayers, even though the camp quotas were very low. In order to do this, in some cases, all other camp projects were seriously reduced or temporarily suspended. Spraying work by the crews at two camps in Connecticut was discontinued toward the end of the month, as the supply of lead arsenate and fish oil furnished by the C. C. C. was exhausted, and also because of the acute labor shortage at the end of an enrollment period. The Connecticut gypsy moth organization furnished an extra half-ton of lead arsenate for the use of one crew where labor was available after the original supply had been used. It is expected that sufficient materials will be available to carry the work from the camp in Massachusetts well into July, as enough was supplied to run the machine on the double-shift basis, while labor was sufficient for only one shift. By the end of the fiscal year 561 acres had been sprayed by the C. C. C. in Connecticut and 140 acres from the single camp in Massachusetts.

Administrative changes affecting C. C. C. gypsy moth work.--C. C. C. work in the corps area, which includes the New England States, has been reorganized, all State offices have been discontinued, and many of the employees have been discharged. All C. C. C. work in this area is now administered and supervised by the United States Forest Service from their headquarters in Boston, Mass. The State foresters will initiate the projects and will contact the Forest Service through a liaison officer who will represent the State interests. Owing to this drastic reduction in C. C. C. administration and supervision, it was not possible for the Forest Service to continue the services of the C. C. C. official who has been assisting in the supervision of the C. C. C. gypsy moth work east of the barrier zone that is supervised by this Bureau. No C. C. C. gypsy moth work is now in progress in Vermont, although it is anticipated that crews will be returned to the work during the winter months. Three crews remain on gypsy moth work in Connecticut and one in Massachusetts. Although the plans of work designate 20-man crews, it will not be possible for the camps to furnish that number of men unless the camp enrollments increase considerably. The work of these remaining crews is important, as most of it is done in towns just east of the barrier zone where considerable infestation is present, and from which the spread of the insect to towns within the barrier zone is possible.

Preliminary observations on current gypsy moth defoliation.--No accurate records on gypsy moth defoliation are available at this time, as the effects of the feeding were only beginning to be visible at the end of June. However, S. S. Crossman has supplied several preliminary notes based on observations made on trips through the infested areas. Defoliation in the Massachusetts and Connecticut areas west of the Connecticut River does not appear to be so heavy and extensive as during some of the previous years, and no severe defoliations have yet been noted in this region. Three large oaks, approximately 50-percent defoliated, were observed in Simsbury, Conn., but these trees were later sprayed by the State gypsy moth force. There is considerable defoliation in the Rockingham-Springfield area in Vermont, although the damage appears to be less extensive than last year. Fairly large areas showing defoliation were observed in Walpole, N. H., across the Connecticut River from Bellows Falls, Vt.; and heavy feeding was reported in several towns in southeastern New Hampshire. Severe defoliations have already been noted in Groton, Westford, Boxford, North Andover, Danvers, Peabody, and in the Concord-Ayer section of Massachusetts, and heavy feeding by the gypsy moth has been reported from several other towns in northeastern Massachusetts. Complete defoliation of apple trees also occurred in Essex, Rowley, and Newberry, Mass.

Previously defoliated areas examined.--Inspections of areas where one or more serious defoliations of woodland trees have occurred during the last 10 or 15 years were made during June in Granby and vicinity in Connecticut, on Cape Cod and the North Shore in Massachusetts, and in Maine and New Hampshire. A large number of oak trees and some white birch, hemlock, and spruce were found to be dead or dying. Some of the trees seem to have showed definite effects during the year following the defoliation and have been gradually dying since that time. In numerous instances the trees had been growing satisfactorily, although in poor soil and sometimes on ridges, and the drying out of the soil following the defoliation hastened their decline; however, many of the dead and dying trees had been growing thriftily in good soil with a plentiful supply of moisture. Some of the areas had been defoliated several times, while others had suffered heavy feeding for 1 year, followed by severe defoliation during the ensuing season.

PLANT DISEASE CONTROL

Southern States appropriate increased funds for white pine blister rust control.--The regional office of the blister rust control project at Richmond, Va., reports that the States in the southern Appalachian region have steadily increased their cash appropriations for cooperative blister rust control work. This is considered a good testimony of their appreciation of the control operations in the white-pine-growing sections of the Appalachian Mountains. The States concerned are Georgia, Maryland, North Carolina, Tennessee, Virginia, and West Virginia. The total cash appropriations for this group of States have increased as follows: 1936, $1,200; 1937, $1,005; 1938, $7,071; 1939, $7,839; 1940, $9,224; 1941, $8,300; and 1942, $14,100. These appropriations are supplemented each year by other cooperative services including supplying office space, the value of cultivated Ribes destroyed, the services of State nursery inspectors, and similar features. The direct State appropriations for this purpose have increased almost every year, with the exception of the fiscal year 1941, during which a serious fire season prevented the State of West Virginia from making as large an allotment to blister rust control as it had anticipated.

New blister rust infections.--Blister rust on white pine was found for the first time in Shenandoah County, Va., on May 7 at the Woodstock Gap picnic ground by State leader J. G. Luce. Infected Ribes had been found in the county previously. Only one tree was found infected and it had a fair-sized branch canker in the aecial stage. The infection was about 5 years old. No Ribes were found nearby. Rust on white pine was found in the fruiting stage along the Moorefield River in Hardy County, W. Va., in May. This is the western-most location in which the rust has been found in Hardy County. The discovery of a new pine infection center on the Shasta National Forest about 14 miles west of Vollmers, Calif., in the Clear Creek drainage, was reported in June. A preliminary report indicates that several sugar pines have numerous cankers, some of them fruiting. The infection is of 1937 origin. Rust was found on western white pine for the first time in Glacier National Park at the head of Lake McDonald, in Montana.

Blister rust exhibit attracts attention.--The blister rust diorama exhibit, which was placed at three county fairs in California in May, namely, Angel's Camp, Chico, and Mariposa (all these districts being adjacent to blister rust areas), was viewed by more than 20,000 people. Considerable interest was shown by the people in the menace of the rust and many comments were overheard on the excellence of the exhibit.

Phenological data.--In Massachusetts, District Leader Brockway found the first uredinial stage of the blister rust reported on Ribes in Lynnfield Township, in Essex County, on June 2, one day in advance of a similar report from Ipswich, Essex County. A report was also received from District Leader Wheeler indicating the development of this stage of the rust on Ribes cynosbati in Southampton, Hampshire County, Mass., on June 2. The first evidence of the telial stage of the rust was reported by Mr. Wheeler in Southampton, Hampshire County, on Ribes hirtellum on June 30. This stage was also noted on July 1 on Ribes sativum (escaped red currant) in Middleton, Essex County. In Connecticut State Leader Riley reported the first uredinia on June 9, found by Mr. Miller. Mr. Riley also states that he found a little uredinial infection on June 12, but it was light. The first evidence of the uredinial stage of the rust in Vermont was recorded in Arlington, Bennington County, on June 3, and in Maryland on June 14, near Deep Creek Lake, in Garrett County. In the North Central region, uredinia was first noted on Ribes in Michigan in the Upper Peninsula on May 23, and in the Lower Peninsula on May 24, although it is believed this was in evidence at least a week earlier. In Ohio it was reported that the production of aecia began as early as April 14.

Results of initial and subsequent surveys in three Ohio counties.--Since 1933, 3 counties in Ohio--Fulton, Geauga, and Portage--have been given a second complete survey for barberry eradication. These are rural counties. The largest town, Ravenna, in Portage County, has a population of about 7,000. There are 9,234 farms in the 1,342 square miles comprising the 3 counties. Harry Atwood, in charge of barberry-eradication work in Ohio, pictures the barberry-eradication situation in these counties as follows: At the completion of the initial intensive survey 1,619,720 barberry bushes had been destroyed on 1,442 properties. If these bushes had been evenly distributed, the barberry concentration would have exceeded 1,311 bushes per square mile, or more than 2 bushes per acre, with an infested property on every 0.87 square mile of area. Only 163, or slightly more than 10 percent, of the properties were found in towns or villages; 11.6 percent were rural locations having planted bushes; and 77.8 percent were properties on which wild bushes were growing. Every sixth farm had bushes, and 1 or more bushes were found growing wild on every seventh farm. During the second intensive survey, which has just been completed, 98 new properties were found infested; 79 of these, or 80 percent, had wild bushes on them. Barberries were found on 30.4 percent of the old locations in Portage County, on 14.3 percent in Geauga County, and on 15 percent in Fulton County. During the second intensive survey of these counties a total of 140,506 barberry bushes were located. This is approximately 8 percent of the total that has been eradicated in this area. The 98 new properties represent 63 percent of the total number that have been found infested. During the second survey 93.5 percent of the bushes found were on old properties. Owing to the wide distribution in these counties, at least 1 more intensive survey will be necessary and thereafter only limited areas will need attention. Geauga and Portage Counties are in the most heavily infested section of the State.

Stem rust causes slight damage to winter wheat.--Stem rust damage in the winter Wheat Belt may be briefly summarized as follows: Stem rust damage in Kansas is not expected to exceed 1 percent. In Nebraska grain is ripe, with very little if any damage in the southern part of the State. There is some green grain in the Panhandle but losses for the State as a whole will not exceed a trace. No damage is expected to winter wheat in Colorado. Damage to winter wheat in Iowa and Missouri will not exceed 1 or 2 percent, and stem rust will cause less than 1-percent damage to wheat in Illinois, Wisconsin, Indiana, Ohio, Michigan, and Pennsylvania.

COTTON INSECT INVESTIGATIONS

Effect of nicotine sulfate for aphid control on pink bollworm moths.--L. W. Noble and O. T. Robertson, of the Presidio, Tex., laboratory, report that cage tests with 4-percent nicotine sulfate-lime dust were conducted to determine whether this insecticide, when used to control aphids on experimental cotton, influenced the population of the pink bollworm moths. In previous tests nicotine sulfate sprays had been found to reduce the hatching of pink bollworm eggs. In tests with 4-percent nicotine dust, the longevity of moths was reduced slightly when cages were dusted at an ordinary rate used for aphid control. In 1 experiment in which cotton in a 4' by 4' by 4-foot screen cage was dusted as for aphid control, the 34 moths lived from 1 to 8 days, or an average of 5.59 days, whereas in an untreated check cage the 24 moths lived from 3 to 10 days, or an average of 6.29 days. In another experiment the moths were confined in small screen cylinders. The dust was applied at the usual rate and the blast was directed within 18 inches of the cylinders on 2 sides so that the drift made contact with the moths. They were stupefied by the nicotine but recovered within a few hours. The 16 moths from the treated cylinders lived from 1 to 9 days, or for an average of 5.44 days, whereas the 18 moths from the untreated cylinders lived from 2 to 9 days, or an average of 5.78 days. In a third test in which the moths were confined in screen cylinders and given an extremely heavy dosage of 4 -percent nicotine sulfate dust, they were killed or did not recover sufficiently to become active. As it is the habit of pink bollworm moths in the field to hide during the day under soil surface debris or in cracks in the soil, they are not so much exposed to contact insecticides as the moths used in these tests. The results of these tests indicate that 4-percent nicotine sulfate dust applied for aphid control on cotton will not affect pink bollworm moths sufficiently to significantly affect the experimental results.

The boll weevil situation in South Carolina.--For some years comparatively few cotton growers in South Carolina have used calcium arsenate dust for boll weevil control. This has been due in part to the light weevil infestations and in part to the fact that several influential agencies in the State have discouraged its use. F. F. Bondy and C. F. Rainwater report that more dusting was done for boll weevil control in June 1941 than in any year since 1930. This was due to the higher infestations in many fields, to the prospect of serious boll weevil damage over large areas, and to the development of the mixture of calcium arsenate with sufficient rotenone to prevent serious aphid infestations. In the hibernation cages at Florence, S. C., the emergence during May and June was 9.99 percent of the 27,500 weevils installed in cages last fall. The percentage emergence was higher this year than during any previous year since the hibernation experiments were started, and the average square infestation in the cottonfields in the vicinity of Florence was higher during the last week of June than in any June during this period, as shown by the following records:

Year	Percentage of boll weevil emergence in hibernation cages during May and June	Average percentage of square infestation during last week of June
1932	3.95	21.90
1933	7.07	15.20
1934	.04	2.10
1935	.71	4.50
1936	.01	2.22
1937	7.03	16.00
1938	.76	5.10
1939	2.54	8.30
1940	.08	.90
1941	9.99	28.8

At Florence the weevil emergence into the cottonfields was studied by collecting all the weevils in a 1/5-acre trap planting of cotton and on a flight screen trap. No weevils were collected before May 15; in the period May 16-31, 33 were collected; from June 1-14, 592 were collected; and from June 16-30, 490 were collected. Of the total weevils collected 43.9 percent were taken after June 14, or after the time for effective mop treatment of cotton. Much of the cotton was too large for effective mopping by June 10. Bondy and Rainwater summarize the situation at Florence, S. C., at the end of June as follows: "The weather in April and May was favorable for cotton, whereas in June the weather was favorable for boll weevil development and not favorable for cotton. The boll weevil emergence in the cages was the highest since hibernation cage experiments were started in 1932. More weevils were taken from the trap crop than any year since experimental trap plots were started in 1938. More weevils were caught on the flight-screen traps than in any year since 1938, when this series of flight-screen studies was begun. The mop applications delayed the square infestation. More dusting is being done for the control of the boll weevil than in any year since 1930. Many farmers mopped their cotton early but the square infestation is now from 18.0 to 58.5 percent. These farmers have turned to the dust applications to try and save their crops."

Pink bollworm hibernation tests in Big Bend of Texas.--L. W. Noble and W. L. Lowry, Presidio, Tex., report that the percentage survival of pink bollworm larvae in hibernation tests conducted at Presidio was higher

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for the winter of 1940-41 than for any winter since the tests were begun. In these tests the larvae are given treatments simulating various winter cultural practices. These treatments consist of different dates of burial at 2-inch, 4-inch, and 6-inch depths, with different date of winter and spring irrigations. The percentage emergence of moths in 1941 and during the previous 5 years for identical treatments was as follows: (1) In the series in which all plots were irrigated on March 15 the percentage of moths emerging this spring in the plots buried on November 1, 1940, was 23.31 percent, as compared with an average of 3.11 percent in 1939 and 1940. In the plots buried on December 1 the survival was 19.54 percent, as compared with 14.94 percent for the 5-year period 1936-40. In the plots buried January 1, 1941, the survival was 24.31 percent, as compared with an average survival of 10.56 percent during the previous 5 years. In the plots buried February 1, 1941, the survival was 35.25 percent, as compared with 10.74 percent during the previous 5 years. In the plots buried March 1, 1941, the survival was 31.45 percent, as compared with an average survival of 7.90 percent during the previous 5 years. The average emergence of moths in all of the plots that were buried on five different dates between November 1 and March 1, all of which were irrigated on March 15, 1941, was 26.78 percent, as compared with an average emergence of moths of 10.32 percent during previous years. (2) In the series in which all of the bolls and cocoons were buried on December 1, 1940, where the irrigation took place on March 10, 1941, the survival of moths was 18.12 percent, as compared with an average of 10.04 percent during the 5-year period 1936-40. Where irrigated on April 1 the survival was 17.84 percent, as compared with 7.30 percent during the previous 5 years. Where irrigated on April 20 the survival was 13.36 percent, as compared with 6.95 percent during the previous 4 years. Where the plots were not irrigated the survival was 6.25 percent, as compared with 4.31 percent during the previous 3 years. The average survival or spring emergence of moths for the entire series where the date of burial was December 1, 1940, was 13.89 percent, as compared with an average survival of 7.50 percent during previous years. The figures given are weighted averages. The total number of pink bollworm larvae in cocoons and bolls installed in these experiments was 39,489. The total number of moths emerging was 5,157.

Winter survival of pink bollworm in the Juarez Valley, Chihuahua, Mexico.--The first record of winter survival of the pink bollworm in the Juarez Valley is reported by Messrs. Noble and Lowry. The occurrence last fall of an unusually heavy pink bollworm infestation in the Juarez Valley (on the Mexican side of the Rio Grande, opposite the lower El Paso Valley) afforded opportunity for conducting hibernation tests in that area. This division, in cooperation with the Division of Pink Bollworm and Thurberia Weevil Control, assisted officials of the Mexican Department of Agriculture in conducting these tests. Although the percentage, emergence or moth recovery from the hibernation cages was low, 10 moth specimens have been identified as the pink bollworm, thus establishing a record of winter survival in this area.

PINK BOLLWORM AND THURBERIA WEEVIL CONTROL

Wild cotton eradication in Florida.--A number of years ago a program was begun to eradicate the pink bollworm from southern Florida and adjacent keys through the destruction of the wild cotton plant, which acts as a host to this dangerous cotton insect and from which it was spreading into the main Cotton Belt. The work for the 1940-41 season was brought to a close at the end of June. The program for the season was an unusually satisfactory one, and was carried out with from 90 to 100 W. P. A. employees, approximately 200 C. C. C. enrollees, and a small number of Bureau employees. At the close of the season the C. C. C. camp was dismantled and moved elsewhere, as that organization will not participate in wild cotton eradication in Florida in the future. Three clean-ups were completed during the past season in nearly all areas, and there was a total reduction of more than half a million seedling plants, over the previous season. For the month of June, 1,347 acres was covered, from which were removed 10,138 seedlings, 34 sprout plants, and 48 plants with mature bolls. During the first week in June a program was inaugurated which had for its purpose the location and removal of dooryard cotton plants from Dade and Broward Counties. In Dade County, cotton found on more than 200 locations yielded 623 mature and 1,157 seedling plants. A very light pink bollworm infestation was found in these dooryard plants. Information obtained in Cuba, as the result of a survey for wild cotton during 1940 and 1941, proved conclusively that the pink bollworm could maintain itself on only 2 or 3 dooryard plants which fruited heavily. Consequently, in the future, dooryard cotton plants in Dade and Broward Counties will be removed each year, to prevent build-up of infestation from that source.

TRUCK CROP AND GARDEN INSECT INVESTIGATIONS

Studies on aphids affecting potatoes in Maine.--Upon the return of D. J. Caffrey to the Washington office, after completing a survey of the investigations on the beet leafhopper, W. A. Shands, who was drafted to serve as a substitute for Mr. Caffrey, has been assigned to a special investigation dealing with the biological aspects of aphids affecting potatoes in Maine. The investigations performed by Mr. Shands will be independent of those carried on by Theo. E. Bronson, who has returned to Houlton, Maine, to resume work on the chemical control of these aphids. It is expected that the information obtained by Mr. Shands will be of value in the applic tion of control measures. Three species of aphids are involved in this problem including the green peach aphid (Myzus persicae (Sulz.)), the buckthorn aphid (Aphis abbreviata Patch), and the potato aphid (Macrosiphum solanifolii (Ashm.)). Little is known regarding the host plants or migratory habits of these aphids. In addition to causing a direct reduction in yield as a result of their feeding, these species of aphids transmit a disease known as "leaf roll," to which the Green Mountain variety of potato is particularly susceptible. Potato tubers affected by this disease exhibit a series of dark concentric rings within their tissue after cooking which reduces their value for culinary purposes.

Thrips control on snap beans fails to increase quality and yield of crop.--Five applications of various insecticides during the period when blossoms of snap beans were heavily infested with thrips failed to increase the quality and yield of this crop, according to an experiment conducted by C. B. Wisecup at Sanford, Fla., during April and May 1941. Four randomized blocks containing 1/65-acre plots were used to compare sprays containing pyrethrum, pyrethrum-rotenone, tartar emetic-brown sugar, and nicotine sulfate, respectively, with untreated checks. In addition to large numbers of the Florida flower thrips (Frankliniella cephalica (Crawf.)), in the blooms, a heavy infestation of the greenhouse thrips (Heliothrips haemorrhoidalis (Bouche)) developed on the leaves. None of these materials prevented an increase in the numbers of thrips, but both the nicotine sulfate and the tartar emetic-brown sugar sprays resulted in thrips populations significantly lower than in the untreated plots. No significant differences in the total weight of bean pods harvested were demonstrated, nor were there any significant differences in the calculated number of bean pods from any treatment. The use of the average weight of the beans harvested as an index of quality showed that the bean pods from the nicotine sulfate treatments were significantly superior to all others. The degree of thrips control obtained did not affect the "set" of bean pods but it appears that the tartar emetic spray affected adversely the quality of the beans produced.

Lead arsenate controls vegetable weevil on shade-grown tobacco in plant bed.--Experiments conducted by F. S. Chamberlin, of the Quincy, Fla., laboratory, have substantiated the results obtained in previous experiments indicating that lead arsenate, used either as a spray or as a dust, will readily control Listroderes obliquus Klug., which has since 1937 become a rather important plant bed pest in that area and which, when carried to the tobacco fields on infested plants, has resulted in serious injury to the stand. The experiments indicated that the arsenical will exert control in either the spray or the dust form at dosage rates of 3 pounds per 100 gallons of the spray or ½ pound of the dust per 100 square yards of plant bed space. Two or three applications during the latter part of the plant-bed growing season usually serve to give sufficient protection against the insect.

Early plowing of winter cover crops reduces wireworm infestation in irrigated lands.--M. W. Stone, of the Ventura, Calif., laboratory, in investigations conducted during 1940-41 with winter cover crops in areas infested by Limonius californicus (Mann.), found that increased wireworm populations will result after even 1 year's planting of winter cover crops, if they are allowed to remain standing during the time of adult emergence or until the last week in March or the first week in April, as was the case in the experimental plots. The following table shows the kind of cover crops tested and the average number of larvae per square foot of soil 16 inches deep in 1940 and in the early and late plowed plots in 1941.

Cover crop	1940	1941	
		Early plowed	Late plowed
	Number	Number	Number
Barley	1.10	0.75	2.31
Mustard	1.26	.54	.94
Clover	1.09	.42	1.15
Vetch	1.45	.28	.72
Fenugreek	1.47	.47	.69
Control	1.05	.40	.33
Average (cover crop)	1.27	0.49	1.16

The above results were based on cover crops planted between November 1 to 6, 1939, in 3 fields, in a randomized-block arrangement of plots, there being 16 replicates of the cover crops, barley, mustard, clover, and fallow plots and 12 replicates of the vetch and fenugreek. Half of the replicated plots were plowed under on February 20 and the remaining half from the last week in March to the first week in April 1940. A total of 20 in 1940 and 24 in 1941 1/4-square-foot samples of soil to a depth of 16 inches were taken at random from each plot and sifted prior to the planting of lima beans in May and June 1940-41.

Green June beetle larvae in tobacco plant beds controlled by gasoline and ethylene dichloride emulsion.--In experiments conducted by L. B. Scott and Joe Milam, of the Clarksville, Tenn., laboratory, on the control of Cotinis nitida (L.) in tobacco plant beds, it was found that both gasoline and the ethylene dichloride emulsion are effective for the control of the larvae when applied by pouring into small holes spaced 18 inches apart in both directions. The emulsion was applied at the rate of 4.7 gallons per 100 square yards of bed (1.5 ounces per hole), whereas the gasoline was applied at the rate of 12.5 gallons per 100 square yards of bed (4 ounces per hole). Examination of the top 12 inches of soil 3 days after the materials were applied showed that the emulsion had killed 83.54 percent of the grubs, whereas the gasoline had killed 67.01 percent. The material caused only slight damage to the tobacco plants. Mustard oil emulsion, kerosene extract of pyrethrum, carbon disulfide emulsion, paris green-bran bait, paradichlorobenzene crystals, paradichlorobenzene in kerosene oil or cottonseed oil, and calcium cyanide failed to provide satisfactory control, the calcium cyanide causing very severe plant damage.

Effect of sugars on production of eggs by narcissus bulb fly.--In experiments conducted at the Sumner, Wash., laboratory, Paul M. Eide found that sugars fed to the narcissus bulb flies kept in cages for the purpose of producing eggs for ovicidal studies had a pronounced effect on the egg laying of these flies. Flies which had only pollen and water available deposited an average of only 8.2 eggs per female, as compared with those furnished maltose, the lowest of the sugar fed flies, which laid an average of 39.1 eggs. The average egg deposition of flies furnished sucrose, plus pollen, was 98.1. The apparent order of influence, as indicated by totals of eggs deposited in 11 series or replications, was sucrose plus pollen, levulose, sucrose alone, dextrose, honey, and maltose. This information is of considerable importance from the standpoint of bait sprays, as it is of interest to know that feeding of the flies must precede egg laying.

INSECTS AFFECTING MAN AND ANIMALS

Clear Lake gnat as a possible food for fish reared in hatchery.--According to A. W. Lindquist, of the Nice, Calif., laboratory, arrangements have been made with the California Fish and Game Commission and a private fish hatchery to carry on some tests using gnats caught in light traps as fish food in hatcheries. There is a possibility that these gnats may provide a valuable supplemental source of factor "H" and others that promote growth and reduce death losses. The gnats are kept in cold storage to prevent decomposition. If a profitable use could be found for the great numbers of gnats obtained in light traps, their control would be greatly augmented with funds so obtained.

Healing extracts of maggots popularized by the press.--During the last month, two popular articles have appeared regarding William Robinson's discoveries on the healing extracts of maggots. One, published in the Du Pont magazine for June, was entitled, "Exit--Wearing Halo, Maggots Saved Lives before Men Knew Why. Modern Science Solved the Riddle, and Now Carbamide, Synthetic Urea, Is Medically Approved in the Healing Arts." The other article was in the June 14 issue of Collier's and is called "Humble Healers."

Cooperative advisory service in control of cattle grubs.--Reports from J. Myron Maxwell to E. W. Laake, of the Dallas, Tex., laboratory, indicated that more than 15,000 cattle in 31 counties in Oklahoma were treated with the standard cube-soap wash during the past winter season. The treatment was under the supervision of the county agents and resulted directly from demonstrations made by the personnel of the Dallas station during the 1939-40 cattle grub season. Two pure-bred herds were treated systematically with the cube-soap wash in Cherokee County, Tex., throughout the last grub season, with practically 100-percent kills of grubs.

Rearing stableflies.--Craig Eagleson, of the Dallas, Tex., laboratory, reports that a very decided improvement in the larval medium has been effected by mixing an equal part of wet peat moss with the fermented chopped alfalfa used as the matrix of the medium. Dr. Eagleson states that, although a complete generation has not been reared on this medium, the large size of the first crop of pupae reared in it was very satisfactory.

Control of sand flies in diked and undiked marshes.--Isolations of larvae from soil samples obtained from diked and undiked marshes during 1939 by J. B. Hull and S. E. Shields, of the Fort Pierce, Fla., laboratory, showed that a reduction of 89.88 percent of the breeding resulted from the use of dikes and pumps. Sand flies emerging in cages placed on the diked and undiked marshes also indicated that 90.65-percent control was obtained. Of the remaining 9.35 percent of the sand fly larvae not controlled in the diked areas, breeding was found to occur in wet soil of the ditches and in low places which did not become dry. During the last quarter highly significant differences were found in diked and undiked marshes within the ditches and at distances of 10, 20, 40, and 75 feet from ditches. In no location was there a significant difference between the mangrove and pickleweed areas.

Persistence of single infestation of American dog tick.--C. N. Smith, of the Vineyard Haven, Mass., laboratory, reports that during April, May, and June no larvae, 1 nymph, and 466 adults appeared in a plot in which various factors were controlled. Hosts of adults were excluded and mice provided on which seed ticks and nymphs could feed at will. The plot was prepared and infested with eggs in 1939. The peak of adult activity was in mid-April, adults declining in numbers steadily until only 22 were found on June 13, 1941.

FOREIGN PLANT QUARANTINES

Entomological interceptions of interest.--A living adult of the lygaeid *Acroleucus vicinalis* Dist. was taken at Laredo on June 4 with pineapples in cargo from Mexico. Two living larvae of the Mexican fruitfly (*Anastrepha ludens* (Loew)) were intercepted at Del Rio, Tex., on April 14 in grapefruit in baggage, and another at Houston, Tex., on June 6 in an orange in quarters, both fruits being from Mexico. A living larva of the trypetid *Anastrepha mombinpraeoptans* Sein was found at Mobile, Ala., on June 2 in mango in stores from Cuba. One living adult of the elaterid *Diasterius cribratus* Lec. was intercepted at Laredo on May 22 with pineapples in cargo from Mexico. Living larvae, pupae, and adults of the otitid *Euxesta stigmatias* Loew were found at Brownsville on June 3 in green corn in baggage from Mexico. Specimens of the coccid *Formosaspis nigra* (Takah.) were taken at the Inspection House, Washington, D. C., on January 29 on the leaf of *Schizostachyum dumetorum* in cargo from China. A living larva and pupa of the gelechiid *Gnorimoschema plaesiosema* (Turner) were found at New York on June 4 in potato in stores from Peru. The coccid *Kuwanaspis vermiformis* (Takah.) was taken at the Inspection House, Washington, D. C., on January 30 on *Phyllostachys* sp. in express from China. The coccid *Lepidosaphes okitsuensis* Kuw. was intercepted at the Inspection House, Washington, D. C., on February 21, 1940, on *Shortia uniflora grandiflora* in mail from Japan. Living larvae of the curculionid *Palaeopus costicollis* Marsh. were intercepted at New York on May 21 in yam and sweetpotato in baggage from Jamaica. Five living and one dead larvae of the pink bollworm (*Pectinophora gossypiella* (Saund.)) were found at Laredo on May 13 in seed cotton in a box car coming from Mexico. Living larvae identified as probably *Rhigopsidius tucumanus* Haller, the Argentine potato weevil, were taken at Seattle on May 27 in potatoes in stores from Peru. Living specimens of the mango weevil (*Sternochetus mangiferae* (F.)) were intercepted at San Francisco on May 27 in mango seed in baggage from Hawaii.

Pathological interceptions of interest.--*Ascochyta pisi* Lib. was found on May 22 at New York on *Vicia faba* pods from Portugal. *Ascochyta* sp., unlike anything reported on Bromeliaceae, was intercepted at Hoboken on February 21 on a bromeliad in mail from Costa Rica. *Ascochyta* sp. was intercepted on April 24 at Laredo on leaves of *Epidendrum* sp. and *Lycaste* sp. in baggage from Mexico. *Asterina delitescens* Ell. & Martin was intercepted on March 28 at El Paso on red bay leaves in baggage from Mexico. *Cercospora angreci* Ferrill & Roum. was intercepted on May 23 at Brownsville on *Laelia* sp. in airplane baggage from Mexico. The same fungus has been determined on a *Cymbidium* sp. leaf from India (apparently first report from India), intercepted in a mail shipment on December 23, 1937, at Washington.

Another belated report is Colletotrichum orchidearum Allesch, intercepted on Vanda sp. (apparently first report on Vanda) in mail from the Philippines on September 26, 1940, at Hoboken. An undetermined species of Phomopsis resembling a stage of Diaporthe eres Nit. was intercepted on May 8 at Seattle on a magnolia plant from England. Diplodia paraphysaria Sacc. was intercepted on special-permit orchid plants from Guatemala on May 2 and from Venezuela on May 17 at San Juan. Diplodina sp. was intercepted on May 13 at Seattle on Ephedra vulgaris from China. Hemileia oncidii Griffon & Maub. was intercepted at Hoboken on April 22 on Epidendrum sp. and on May 26 on Oncidium sp., both being special-permit mail shipments from Costa Rica. Heterodera marioni (Cornu) Goodey was intercepted on May 26 at Miami in carrots from Bahamas. Kuehneola malvicola (Speg.) Arth. was found on April 17 at Roma, Tex., on a plant of Hibiscus cardiophyllus from Mexico, intended for propagation. Leptosphaeria eustoma (Fr.) Sacc. was found on April 13 at New York on banana leaves in stores from Cuba. Macrophoma oncidii P. Henn. was intercepted on April 2 at San Francisco on Cypripedium haynaldianum in mail from the Philippines. Microthyrium sp. (no previous reports found on Orchidaceae) was intercepted on March 26 at Brownsville on Epidendrum sp. from Mexico. Mycogone sp. (no species reported on orchids) was found on August 22, 1940,at Hoboken, on Cattleya sp. from Brazil.Pestalozzia sp. (no species found reported on the host genus) was intercepted on February 24 at San Francisco on Marica coerulea grandiflora from Costa Rice. Phoma bakeriana Sacc. was intercepted at New Orleans on August 11, 1940,on Vigna sinensis pods from Dutch Guiana. Phyllosticta laeliae Keissl. was intercepted on August 12, 1940, at Seattle on Cattleya sp. from Costa Rica. Phyllosticta sp. (the same undescribed species previously intercepted on orchids from West Indies, Central America, and Japan) was intercepted at Seattle on April 12 on Dendrobium phalaenopsis from the Philippines. Pratylenchus pratensis (de Man) Fil. was intercepted on May 21 and Rotylenchus bradys (Steiner & Le Hew) Fil. on June 4 at New York in yams from Jamaica. Selenophoma sp., unlike anything found described on orchids, was intercepted on September 25, 1940, on Laelia sp. from Brazil, and a similar fungus on April 1, 1941, at Hoboken on Oncidium sp. from Guatemala. Septobasidium prunophilum Couch was found on April 30 at San Francisco on Prunus sp. twigs in stores from Japan. Uredo oncidii P. Henn. was intercepted on April 23 at Hoboken on Oncidium sp. from Guatemala. Uredo sp. was intercepted on May 15 at Hoboken on Batemannia sp. in mail from Costa Rica.

DOMESTIC PLANT QUARANTINES

The grasshopper situation.--The grasshopper infestation throughout the Great Plains States is in general much lighter than in 1940. Rains during June delayed grasshopper development and at the same time produced lush marginal vegetation, which in many instances held grasshoppers out of crops. The principal infestations occur in the following areas: (1) In Minnesota a heavy infestation of the two-striped grasshopper (Melanoplus bivittatus Say) exists in the Red River Valley. Widespread baiting operations are in progress in 3 northwestern counties, but have been delayed somewhat by unfavorable weather and extensive farm operations. Over 3,600 tons of wet bait have been spread in Kittson, Marshall, and Polk Counties. (2) In central South Dakota the same species is reported as developing increased local migrations into small-grain fields with crop injury severe in places. Sufficient bait materials are on hand to meet immediate needs in this area but there is a lack of farmer interest in the spreading of bait. (3) In Kansas an infestation of the lesser migratory grasshopper (M. mexicanus Sauss.), estimated to cover approximately 500,000 acres, recently developed in the southwestern counties, resulting in flights in a north and northwesterly direction into Colorado, Nebraska, and possibly Wyoming, throughout the latter part of June. These flights were made, however, before damage to small grains occurred. Farmers displayed little interest in baiting in this wheat-growing section, apparently hoping that harvesting would be well under way before damage could be serious. A study to determine the direction, extent of the migrations, and the resultant changes in population at the origin and termination points of the flights is being made by control supervisors and survey inspectors, in cooperation with workers from the grasshopper-research office at Bozeman, Mont. (4) In Arizona a severe infestation of M. mexicanus developed early in June in the Sulphur Springs Valley, covering approximately 1,000,000 acres of range and desert land in Cochise and Graham Counties. Small crop areas adjoin the infestations. Populations in these fields ran as high as 50 per square yard and flights occurred on June 12 and 13, extending northeastward into the margin of Gila Valley. A careful survey will be made of these migrations and others which may occur. It was deemed inadvisable by the local ranchers and farmers to attempt control measures on a large scale against this infestation because of the wide distribution over range land. It is believed that damage to the range will not be excessive, except in very localized areas. Sufficient bait materials have been sent to meet the needs of the farmers in protecting cultivated areas, and bait spreaders and mixers have been made available to the local agencies. (5) In Texas, baiting decreased in the south and east-central areas, where the differential grasshopper (Melanoplus differentialis Thos.) reached the adult stage. This infestation, which was particularly threatening a month ago, now seems to be well under control.

Armyworm infestations subsiding.--The outbreak of armyworm (Cirphis unipuncta Haw.) in the Oklahoma and Texas Panhandles, as reported in the July 1, 1941, issue of the News Letter, had subsided by the early part of June, and most of the worms had entered the pupal stage. Farmers in the areas where armyworm infestations first developed reported that baiting was instrumental in saving a good portion of the small grain from destruction.

The Mormon cricket situation.--Mormon crickets are reaching maturity throughout the infested States and in most places oviposition is in progress. Bands of younger crickets, however, continue filtering down from high altitudes. Egg deposition of the Coulee cricket, Peranabrus scabricollis Thos., was practically complete by the end of June. The intensive control operations in Oregon where bait was being spread by aircraft has been brought to a close, with the exception of 2 heavy migrations north of the Warm Springs Indian Reservation, where baiting is still in progress. Kills of Mormon crickets with sodium fluosilicate bait by airplane strip-baiting ranged from 95 to 100 percent during periods of favorable weather, and from 50 to 75 percent on days unfavorable for cricket feeding. Owing to a lighter infestation of Coulee crickets, strip-baiting of this species resulted in kills averaging only about 80 percent. In Nevada general activity of the Mormon cricket during June was less than expected, owing to cool weather and continued rains. During the last week in the month, however, cricket migrations increased in intensity. In Idaho cooperation in large-scale control measures by volunteer sources has continued to afford excellent crop protection. In Jefferson and Madison Counties, Idaho, an average of 50 volunteer workers donated their services each day during the week ended June 21, and also furnished trucks and teams for hauling and spreading bait to fight heavy bands of crickets along an 8-mile front. Forty-five tons of sodium fluosilicate bait (dry weight) were spread. Excellent control was obtained, dead crickets being observed to the extent of 70 to 80 per square yard. Moderate to heavy localized migrations of crickets also occurred in Yellowstone and Big Horn Counties, Mont., in Juab and Tooele Counties, Utah, and in Hot Springs, Sheridan, and Washakie Counties, Wyo. Crop damage was prevented or held to a minimum in all these areas. Mormon cricket migrations in south-central South Dakota were halted early in June, after which the crickets scattered, and little crop damage occurred.

White-fringed beetles emerge.--Adult white-fringed beetles were observed during June at various points in the infested States and by July 10 emergence was observed in all the infested areas. Except in New Orleans, where a large percentage of the insects have now reached the adult stage, peak emergence is expected between the 10th and 20th of July.

White-fringed beetle control under way.--In accordance with the provisions of the program of work which called for the application of control measures, such operations are being conducted cooperatively with the States, and will be continued through the period of peak emergence of the beetles in the areas as a whole in places where the infestations are of such a nature as to present an appreciable hazard of artificial or natural spread. Such work is also being continued in the 5 areas of isolated infestations on which an attempt is being made to determine the effectiveness of different methods as to each type of area, with eradication as an objective. At Bolton, Miss., which is one of the areas where eradication is being attempted, 28 recently emerged beetles were found, of which 26 were dead, indicating the effectiveness of control measures. Later, some 60 beetles, most of which were dead, were found in the same yard.

Chinch bug infestations light.--Because of the prospects of heavy chinch bug infestations in Illinois, Indiana, Iowa, Kansas, Missouri, Nebraska, and Oklahoma, as indicated by the survey conducted by the Bureau in the fall of 1940 and by reports from State officials during the winter, the Secretary, on June 9, allotted for chinch bug control funds from the appropriation for the control of emergency and incipient outbreaks of insect pests and plant diseases. State officials kept the Bureau informed as to developments of infestations throughout June and inspectors were assigned by the Bureau as requested to assist them in estimating needs for creosote, and in supervising its distribution. Heavy rains occurring at frequent intervals throughout the infested areas during June and the early part of July, reduced the populations of chinch bug nymphs and produced a heavy growth of vegetation, which in many instances kept the insects in small-grain fields after harvest and thereby reduced migrations into corn. Fungus disease, occasioned by the dampness, also contributed to the further destruction of these pests. Consequently, the need of constructing creosote barriers to protect cornfields was minimized and requests for creosote came from only a few counties in the entire chinch bug area. By July 10 a total of 270,850 gallons had been purchased and delivered, as compared with nearly 2,150,000 gallons used by July 10 of last year. The situation, as reported in the early part of July by State leaders and field scouts, indicated that little, if any, more creosote would be needed. The most severe threat to corn this spring existed in Kansas, Nebraska, and Iowa, but even in these States the infestations were very spotted and generally light, in comparison with last year's infestations.

Phony peach inspection.--In the phony-diseased area nursery environs inspections were made the first order of business in June. Over 22,000 properties were inspected in 12 States and it is probable that, with a very few exceptions, all the 388 nurseries, the surrounding zones of which were inspected, will meet certification requirements.

Peach mosaic inspection.--During June, orchard inspection for the peach mosaic disease was continued in Arizona, California, Colorado, New Mexico, Texas, and Utah. In California the number of trees found infected represented a reduction of 25 percent over last year. In Colorado the finding of 7,147 mosaic trees in Mesa County represents an increase of 2,065 over the 1940 season.

Fifteen States assist in peach-tree inspection.--In the 18 States in which inspection was conducted for both the phony peach and peach mosaic diseases, State cooperation was represented by 67 field supervisory employees and 1 office worker. Of these, the State of California assigned 16, Colorado 13, Alabama 9, Texas 5, Utah 5, Tennessee 4, Mississippi 3, Arkansas 2, Georgia 2, Illinois 2, Louisiana 2, North Carolina 2, Kentucky 1, Missouri 1, and South Carolina 1.

Citrus canker eradication.--A close recheck in June of the 6 properties at Navasota and 2 properties at Corpus Christi, Tex., where citrus canker was discovered early this year, resulted in finding no indications of the disease at this time. Orange trees which had been sold from the infected nursery at Corpus Christi to local residents were also inspected, with negative results. The 6 Navasota properties were searched for seedlings developing since the hedges were eradicated, with the result that young seedlings were found on 3 of the properties--nearly 20,000 on 1 property--while the other 3 properties remained apparently free from them. Inspection was also conducted in June in the Texas counties of Milam, Colorado, Fort Bend, and Harris, and tree-removal work in Grimes, Galveston, and Brazoria Counties. The force employed in Texas was comprised of 21 Federal inspectors, 1 State man, and 128 W. P. A. laborers.

CONTROL INVESTIGATIONS

The use of fatty acids in insecticidal aerosols.--W. N. Sullivan and J. H. Fales, of this Division, with L. D. Goodhue, of the Division of Insecticide Investigations, have shown that some relatively nonvolatile compounds, when applied in smoke or fog form, show promise as fumigants against insects. This development makes possible the use of safe and inexpensive insecticides formerly considered impractical because of difficulties in producing effective concentrations at room temperatures. In practice a solution of the insecticidal material was sprayed on a heated surface. On coming in contact with the hot surface, the solvent was evaporated with explosive violence, and any dissolved material that does not vaporize readily was reduced mechanically to colloidal dimensions. That is, the insecticide was dispersed as an aerosol consisting of a suspension of the solid or liquid particles in air. By this method of volatilizing it was possible to keep the insecticide dispersed in an enclosed space for a long time. The rate of evaporation was also greatly increased and the maximum vapor concentration was quickly obtained because of the tremendous surface of these small particles. The potency was further increased by the direct contact action of these small particles. The apparatus used in this work consisted of a small nasal type atomizer mounted 4 inches above the center of an electric hot plate held at 375° C. A small electric compressor was used to maintain the air pressure that operated the atomizer. To stabilize and increase the toxicity of these insecticidal aerosols, fatty acis (lauric or eleic) were added to the spray solution. It was shown with biological tests against the housefly that these materials increased the effectiveness of orthodichlorobenzene. The relative effectiveness against houseflies of these tests, in 30-minute exposure periods, are given in the following table. Orthodichlorobenzene was used at the rate of 0.28 cc. per cubic foot and the fatty acid at 0.071 gram per cubic foot.

Material tested	Insects tested	Mortality after 2 days
	Number	Percent
Orthodichlorobenzene------------------	609	2
Orthodichlorobenzene plus oleic acid-	440	55
Orthodichlorobenzene plus lauric acid	471	60
Lauric acid---------------------------	216	1
Oleic acid----------------------------	220	1

Although lauric and oleic acids are substantially inert when used alone, under the conditions of these tests they act as adjuvants when combined with orthodichlorobenzene and greatly increase the effectiveness of the aerosol. Certain fatty-acid derivatives, such as salts, esters, and the like, also gave increased insecticidal action. The results were corroborated by room tests against the roach and the bedbug, where a 100-percent mortality was obtained by using 1.5 pounds of orthodichlorobenzene containing 5 percent of lauric acid per 1,000 cubic feet. This method of producing an aerocolloidal dispersion by spraying liquid toxins on a heated surface might be of use to bacteriologists, who have found bactericidal aerosols effective in decontaminating rooms. A note on this subject has been accepted for publication in Science.

INSECTICIDE INVESTIGATIONS

Use of aerosols discussed at Durham meeting.--L. D. Goodhue presented a paper on the application of the aerosol to fumigation before the meeting of the American Association of Economic Entomologists at Durham, N. H., on June 25 and 26, 1941. This was a discussion of the work carried on in cooperation with W. N. Sullivan and J. H. Fales, of the Division of Control Investigations. Since the use of aerosols for the control of insects is not generally familiar to entomologists, an explanation of their properties was given. It was shown that solid insecticides could be separated into particles small enough to stay suspended in air for as long as 24 hours, thus making possible the use as fumigants of nonvolatile compounds that could not be used in any other way. A small laboratory testing chamber was described in which insecticides in solution are sprayed on a hot surface to produce the aerosol. Approximately 200 organic compounds have been tested in aerosol form against the housefly in this apparatus. Some of the most toxic compounds were rotenone, pyrethrum, 3-chloroacenaphthene, 3-chlorodibenzofuran, xanthone, phthalonitrile, and pentachlorophenol. Considerable interest in this new method was shown. The proceedings of the symposium are to be published in book form.

Composition of a commercial geraniol used in Japanese beetle baits.--About 25,000 pounds of commercial geraniol are used annually in baits for the Japanese beetle. The approximate percentage composition of the commercial geraniol studied by Howard A. Jones and H. L. Haller, of the Division of Insecticide Investigations (see News Ed. of Amer. Chem. Soc. Jour. v. 19, No. 12, pp. 683-685, June 25, 1941) was as follows: Terpenes, 4; aldehyde, 1; citronellol, 17; nerol, or geraniol not combining with calcium chloride, 7; citronellyl acetate, 2; geraniol, 34; geranyl acetate, 8; geranyl butyrate, 0.2; eugenol, 1; gamma-cadinene, 8; elemol, 10; gamma-cadinol and other sesquiterpene alcohols (by difference), 7; bieugenol, 0.2; zinc salt, 0.2. The material appears to be a fraction of citronella oil comprising the major portion of the distillate remaining after the removal of most of the citronellal, with a small proportion of terpenes added back.

BEE CULTURE

Self-fertilization is being accomplished in the honeybee.--Otto Mackensen, Baton Rouge, La., reports: "Queenbees have been successfully mated with their sons. The consequence of such matings is the same as self-fertilization, since a queen's sons are produced from unfertilized haploid eggs. To accomplish such matings it is necessary to force virgin queens to begin laying by preventing mating flights, and then to inseminate them with sperm from their sons as soon as these have become sexually mature. The queens are caged for 3 days before insemination to retard egg production so that the oviducts will be empty and ready to receive semen. In most cases at least a few worker progeny are produced. This technique is expected to be useful whenever severe inbreeding is desirable."

Live-bee demonstrations prove interesting to individuals inexperienced with bees.--The Division's sublaboratory maintained at the Fruit and Truck Branch Experiment Station of the University of Arkansas, at Hope, Ark., is frequently visited by agricultural groups who come to the station to attend meetings of various kinds. S. E. McGregor, in charge of the sublaboratory, describes his method of handling such groups as follows: "Giving a live bee demonstration has proved more interesting than a monologue on bees and bee behavior to groups visiting the University of Arkansas Fruit and Truck Branch Experiment Station. A screen cage has been built to fit over the bed of a pick-up truck and when the time comes to give the demonstration a colony of bees is picked up in the apiary and set into the truck, which is then driven directly into the amphitheater in which the crowd is assembled. Before entering the cage, a short talk is given on proper preparation, during which time the veil and gloves are donned and the smoker is lighted. When giving the demonstration, frames of honey, brood, and bees are held up where they can be seen plainly by the audience. Some humor can be added such as finding a mosquito in the cage, getting too hot and having to remove gloves, veil, and finally shirt; or showing how a swarm may be brought home in your hat so that if you meet the owner you merely put your hat on and walk by unsuspected. This immediately brings a dare from someone in the audience to see this done and after telling him how crazy he is for really taking you seriously, you absent-mindedly put the hat on your own head, much to the delight of the audience. This type of talk is of special interest to those persons who have never before seen inside a modern bee hive."

INSECT IDENTIFICATION

Bruchus hamatus Miller intercepted.--Adults of B. hamatus Miller were found recently in a shipment of seeds from Leningrad. The seeds are very similar to those of Lathyrus vernus Bernhardi and probably belong to this or a closely related species. The latter plant, collected in Turkey by Westover and Wellman in 1937, was found heavily infested by Bruchus hamatus. No previous host-plant record has been found. Although the recent shipment of seeds was sent from Leningrad, it is probable that it originated from farther south in Europe, as the known distribution of the bruchid is confined to islands of the Adriatic Sea, Greece, Syria, and Turkey. Lathyrus vernus is an ornamental, erect, perennial pea with flowers 3/4 inch long. It is but little known in America.

An interesting ant submitted from Africa.--Recently there have been submitted for determination some ants which are important coffee pests at Dembia, Africa. They were sent by R. L. Steyaert, Division de Phytopathologie, Bambesa, Belgian Congo. Concerning one of the forms, a species of Macromischoides, apparently africanum (Mayr), Mr. Steyaert writes as follows: "Two or three bites (of this species) are sufficient to induce high fevers and extreme pain and stiffness in the limbs. It is also usual to have swellings of the glands under the armpits." M. R. Smith states that it is probable that the sting rather than the bite is responsible for the pain and fever.

Calomycterus setarius Roelofs in Illinois.--First reported from North America at Yonkers, N. Y., in 1930, this Japanese weevil has since been found in Connecticut, Massachusetts, Pennsylvania, and Maryland; and in a collection sent for identification by the Illinois Natural History Survey are two specimens of C. setarius labeled "Arlington Hts., Ill., Aug. 26, 1940, V. A. Sturm."

Urania fulgens (Bdv.) collected in Texas.--A single specimen of the day-flying moth Urania fulgens (Bdv.) collected at San Antonio, Tex., April 7, 1941, was sent in recently by Dee Montgomery. Two specimens were taken on April 17, 1941, at Austin, Tex., by C. D. Orchard. These are the first records of this species' being found in the United States. Specimens were numerous at both localities during April and were frequently seen feeding on wild garlic (Allium sp.). There are numerous published records of Urania fulgens (Bdv.) migrating toward the north from southern Mexico and Central America and it is not surprising that some specimens should reach Texas.

Anuraphis apiifolia Theo. intercepted from Portugal.--Specimens of Anuraphis apiifolia Theo. were taken at New York on a shipment of celery from Portugal. This is the first time the species has been intercepted in this country and its first known record from Portugal. Previously it has been recorded from Egypt and Morocco.

Psylla spartii (Guer.) in Washington.--Specimens of a psyllid collected from Scotch broom (Cytisus scoparius Link) at Vashon Heights, Vashon Island, Wash., on May 1, 1940, by W. W. Baker, of the Division of Truck Crop and Garden Insect Investigations, have been identified as the European Psylla spartii (Guer.). Although a few specimens of the species were collected at Fort Lewis, Wash., in 1935, by R. H. Beamer and P. W. Oman, the specimens submitted by Mr. Baker constitute the first adequate sample of the species from an American source and made possible its determination. Psylla spartii has been reported as abundant on broom in central Europe and England.

New distribution records for two Scarabaeidae.--Anomala orientalis Waterhouse has been collected in the District of Columbia by E. A. Chapin, of the National Museum. This is the first record of this species in the District. So far it has not been recorded from Maryland. Beetles reared from a considerable number of larvae collected early in April at Pittsville, Md., have been identified as Hoplia equina Lec. This is the first record of the occurrence of this species south of Massachusetts. The larvae were at the roots of a hedgerow consisting of small Liquidambar shrubs growing on the banks of a drainage ditch.

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